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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,797	01/07/2002	Neil J. Goldfine	1884.1015-006	3789

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EXAMINER	
WEST, JEFFREY R	

ART UNIT	PAPER NUMBER
2857	

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/040,797	GOLDFINE ET AL.
	Examiner	Art Unit
	Jeffrey R. West	2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3,5-17,22-25 and 28-32* is/are pending in the application.

4a) Of the above claim(s) *22-25,28 and 29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,3,5-17 and 30-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 32 is unclear because it recites "alter the operating point" while there is no mention of any "operating point" in parent claim 10. Parent claim 10 does define operating point parameters and property estimation grid points and therefore it is unclear to one having ordinary skill in the art whether "the operating point" refers to the operating point parameters, property estimation grid points, or a different value.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 3, 5-10, 12-16 and 31 are rejected under 35 U.S.C. 103(a) as

being unpatentable over U.S. Patent No. 5,453,689 to Goldfine et al. in view of Zaretsky et al., "Continuum Properties from Interdigital Electrode Dielectrometry".

Goldfine discloses apparatus, devices, methods, and techniques for non-contact measurement of physical and kinematic properties of a material under test comprising, in one embodiment, an electromagnetic structure capable of imposing an electric field in the material under test when driven by an electrical signal and sensing an electromagnetic response, an analyzer for applying an electric signal to the electromagnetic structure and sensing the response, and a property estimator for translating the sensed response into estimates of one or more pre-selected properties of the material (column 6, lines 21-57). Goldfine discloses defining a dynamic range and property estimate tolerance requirements for pre-selected properties of the material under test (i.e. operating point parameters), geometric and configuration properties for an electromagnetic apparatus, and a continuum model for generating property estimation grids for the pre-selected material properties as well as operating point response curves for pre-selected operating point parameters (column 6, line 58 to column 7, line 2). Goldfine discloses analyzing the grids and curves using a sensed electromagnetic response at each operating point, and performing property estimation over the defined range using the estimation grids and operation curves (column 7, lines 3-17). Goldfine discloses using the grids and operation curves to optimize the

operating parameter points, and sensor and material structures (column 25, lines 34-52).

In another embodiment, Goldfine discloses defining physical and geometric properties for a material under test including pre-selected properties of the material under test (column 7, lines 24-26), such as physical, geometrical, and dimensional properties (column 13, lines 9-10). Goldfine discloses defining operating point parameters and geometric properties for the magnetometer (column 7, lines 26-28) and applying all the parameters/values into a model to compute an input/output terminal relation value that is a response value of transimpedance magnitude and phase, with the magnitude and phase being equivalent to real and imaginary parts (column 1, lines 24-25). Goldfine discloses recording the terminal relation value and repeating the process after incrementing the pre-selected properties of the material under test and repeating this process until desired conditions are met at which time the terminal relation values are plotted to form a multidimensional magnitude-phase property estimation grid (column 7, lines 29-37, column 9, lines 56-59, and Figure 29) and analyzing the property estimation grid to determine a fitness for a particular measurement (column 23, lines 15-21). Goldfine also discloses that the overall property estimation grid plots contain a magnitude-magnitude plot of conductivity magnitude, represented by a first axis, versus a non-dielectric determined foil thickness magnitude (i.e. delta), represented by a second axis (Figure 29).

Goldfine discloses the magnitude-magnitude plot providing at least two values of thickness (column 9, lines 56-60) and recording a terminal relation value for each thickness (column 25, lines 12-24) wherein the thickness value is an effective field penetration depth (column 26, lines 9-15).

Further, although Goldfine doesn't specifically disclose a database for storing the terminal relation value as a property estimation grid point, it is considered inherent that in order for the method to plot a plurality of terminal relation values obtained over time in an estimation grid, there must be some storage medium/database for saving the values until they are plotted.

Goldfine also discloses performing the aforementioned steps as well as adjusting the pre-selected property of the material under test to compute another terminal relation value and corresponding Jacobian elements, defined as the variation in a computed terminal relation value due to variation in the pre-selected material property (column 7, lines 47-55), computing a singular value decomposition for the Jacobian elements to obtain singular values, singular vectors, and condition numbers of the Jacobian elements (column 7, lines 56-63) to evaluate the magnetometer and operating point parameters, and adjusting the magnetometer model values and repeating the process until desired estimates are achieved (column 7, lines 59-67).

Goldfine also discloses choosing the model operation based upon the range of the excitation frequency and therefore it is considered inherent that this parameter must first be defined before being inputted into the model to allow proper model selection (column 6, lines 35-57).

With respect to claims 7 and 8, Goldfine also discloses plotting the magnitudes at the same wavelength, or as a function of multiple wavelengths (column 18, lines 23-34).

With respect to claim 13, Goldfine discloses using the singular values, singular vectors, and condition numbers to obtain property estimates and also discloses storing these values used to calculate the property estimates with grid points (column 17, lines 3-9).

As described above, Goldfine teaches many of the features of the claimed invention. Goldfine also teaches that these apparatus and methods are for use in either magnetometer or dielectrometer applications depending on the range of the excitation frequency (column 6, lines 35-57). Goldfine, however, does not teach a corresponding structure specific to the dielectric operation or the corresponding defined parameters required for dielectric property estimation (i.e. electrode parameters).

Zaretsky teaches a modal apparatus for deriving a model that makes an interdigital electro microdielectrometer applicable to measuring continuum parameters in a wide range of heterogeneous media comprising defining pre-selected electrical properties of a material (i.e. surface capacitance density), wherein the surface capacitance density also defines all the heterogeneity and structure of the substrate medium (i.e. physical/geometric properties), and electrode geometry and configuration (i.e. electrode structure and spacing) (page 900, column 1, paragraph 2). Zaretsky teaches inputting these defined properties/configuration data into a model to compute an

input/output terminal response/relation value (page 900, column 2, paragraph 1). Zaretsky also teaches using these values to determine phase grids/graphs based upon the model output (page 906) and also specifies a material for testing as a viscous curable epoxy (page 899, column 2, paragraph 2) and, although not specified by Zaretsky, a curable epoxy has the inherent properties as being both a liquid mixture and a semi-insulating material (See U.S. Patent No. 5,763,901 to Komoto et al. column 5, lines 57-60 and JP Publication No. 56-151538 to Isobe et al., Constitution).

It would have been obvious to one having ordinary skill in the art to modify the invention of Goldfine to include a corresponding structure specific to the dielectric operation and the corresponding defined parameters required for dielectric property estimation (i.e. electrode parameters), as taught by Zaretsky, because Goldfine teaches use of the method and apparatus for sensing properties outside the range of normal magnetometers and dielectrometers (column 6, lines 10-21) and suggests that the general method and apparatus can be used to calculate dielectric property estimations with the addition of a specific structure and parameters (column 22, lines 49-54). Thereby, Zaretsky teaches this required structure and required parameters for applying the method of Goldfine for a dielectrometer structure rather than only a magnetometer structure in order to achieve desired frequency responses and property estimations over a wide range of heterogeneous media (abstract and page 900, column 1, paragraph 1).

5. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goldfine et al. in view of Zaretsky et al. and further in view of U.S. Patent No. 4,876,511 to Clark.

As noted above, the invention of Goldfine and Zaretsky teaches many of the features of the claimed invention and while the combination does teach determining both the permittivity and conductivity (Goldfine, column 21, line 50 to column 22, line 42), as well as generating property estimation grids as magnitude-phase grids for determining the conductivity and thickness (Figure 29), the combination does not specifically include generating a phase-phase property estimation grid.

Clark teaches a method and apparatus for testing and calibrating an electromagnetic logging tool including means for transmitting electromagnetic waves to excite conduction currents wherein the difference between two different phases are used to determine the conductivity and permittivity (column 3, line 63 to column 4, line 8).

It would have been obvious to one having ordinary skill in the art to modify the invention of Goldfine and Zaretsky to include generating a phase-phase property estimation grid because Goldfine and Zaretsky does teach determining both the permittivity and conductivity and, as suggested by Clark, the combination would have provided a means for determining these values by using a property estimation grid displaying the well-known relationship between phase-shift, permittivity, and conductivity (column 3, line 63 to column 4, line 8).

6. Claims 11, 17 and 32, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldfine et al. in view of Zaretsky et al. and further in view of U.S. Patent No. 5,223,796 to Waldman et al.

As noted above, the invention of Goldfine and Zaretsky teaches all of the features of the claimed invention except for specifying that the operating point parameters are temperature dependent and variations in the temperature are used to alter the operating point or specifying that the material be monitored as part of a quality control process.

Waldman teaches apparatus and methods for measuring the dielectric and geometric properties of a material under test with operating parameters of the material under test affecting the monitored signal (column 7, lines 20-27) comprising specifying the configuration, properties, and geometry of testing electrodes (column 8, lines 27-66 and column 9, lines 37-53) and including a temperature sensor that measures the temperature of the material under test in order to compensate the measured operating parameters of the material under test (column 11, lines 23-34). Waldman also teaches plotting and adjusting measured parameters using property curves (column 15, lines 49-66) and generating a continuum model using defined matrices (column 16, lines 40-67). Further, Waldman teaches sending measured results to a remote computer for online quality control (column 11, lines 14-22).

It would have been obvious to one having ordinary skill in the art to modify the invention of Goldfine and Zaretsky to include specifying that the operating

point parameters are temperature dependent and variations in the temperature are used to alter the operating point and specifying that the material be monitored as part of a quality control process, as taught by Waldman, because Waldman suggests that the combination would have produced a higher degree of accuracy by compensating for variations caused by temperature (column 11, lines 23-34) as well as allowed the user of the method to obtain desired results by monitoring the results continuously and making changes accordingly to maintain the necessary output (column 11, lines 14-22).

Response to Arguments

7. Applicant's arguments with respect to claims 2, 3, 5-17 and 30-32 have been considered but are moot in view of the new ground(s) of rejection. The following arguments, however, are noted.

Applicant first argues that "[w]hile the winding constructs of Goldfine can incorporate multiple defined spatial wavelengths, as noted by the Examiner, Goldfine does not suggest plotting responses from winding constructs having different spatial wavelengths to form a single property estimation grid. Zaretsky does not supplement this failing in teachings of Goldfine. Therefore, independent Claims 2 and 10 are not obvious in view of the combination of Goldfine and Zaretsky and the rejection should be withdrawn."

While the grounds of rejection has been changed due to Applicant's amendments, the Examiner also notes that independent claims 2 and 10 do

not have any limitations for "plotting responses from winding constructs having different spatial wavelengths". (Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993)).

Similarly, Applicant argues that "[a]lthough Waldman does teach measuring temperature of the material in order to compensate for the measured operating parameters of the material under test, Waldman does not teach or suggest using the temperature to isolate the measurement values associated with individual properties, as recited, for example in Claims 11 and 32." The Examiner asserts that these particular limitations are not present in claims 11 and 32. Claim 11, for example, only recites "wherein one or more of the operating point parameters in steps (b) and (c) is temperature dependent and wherein variations in the temperature are used to alter the operating point."

Applicant also argues, "[f]urthermore, Waldman does not supplement the failings of teachings of Goldfine and Zaretsky in such a way to render claims 11 and 17 obvious", but does not supply any support as to why the combination does not meet the claimed limitations.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,763,901 to Komoto et al. teaches a semiconductor light-emitting device and method for manufacturing the device including a teaching that an curable epoxy resin is a liquid mixture (column 5, lines 57-60).

JP Publication No. 56-151538 to Isobe et al. teaches a mold for molding expandable thermoplastic resin including a teaching that an epoxy resin is semi-insulating (Constitution).

U.S. Patent No. 4,209,747 to Huchital teaches an apparatus for determination of subsurface permittivity and conductivity using phase shifts.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (703)308-1309. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703)308-1677. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

jrw
August 2, 2004

MARC S. HOFF
SUPERVISORY PATENT EXAMINER
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